



THE SMARTPHONE DILEMMA IN EARLY CHILDHOOD EDUCATION: MITIGATING NEGATIVE SOCIO-EMOTIONAL DYNAMICS THROUGH COOPERATIVE PLAY

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Abstract:

The increasing use of smartphones among young children has raised concerns regarding their influence on social behaviour and emotional development in early childhood learning contexts. This study aims to explore how smartphone exposure shapes children's social interactions and emotional responses in educational settings. A qualitative descriptive approach was employed involving early childhood learners, teachers, and parents as participants, with data collected through classroom observations, semi-structured interviews, and document review. The findings indicate that frequent smartphone exposure tends to reduce peer interaction, shorten attention spans during learning activities, and trigger more impulsive emotional reactions when children are separated from their devices. However, structured classroom strategies such as cooperative play, storytelling, and guided group activities were found to help restore social engagement and improve emotional responsiveness. The study contributes by providing contextual evidence on how digital exposure influences early childhood socio-emotional dynamics. These findings suggest the importance of balanced smartphone use and active parental-teacher supervision to support healthier developmental outcomes.

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INTRODUCTION

Digital technology is part of our daily lives, and rapid development and extraordinary designs are changing children's lives, including in early childhood. Smartphones, as easily accessible digital devices, are often used as tools to calm or entertain children (Andersson, 2022; Nielsen & Arvidsen, 2021; Sultana & Hawken, 2023). Piaget's cognitive development theory emphasises that children learn optimally through direct interaction with the physical and social environment (Dasen, 2022; Wynberg et al., 2022). However, the facts show that more and more children spend their early years with smartphones than playing actively with their environment and friends. This change is not only a matter of habit but also affects children's social-emotional development at a critical age. Therefore, it is important to explore the gap between traditional developmental theory and the reality of current smartphone use.

Previous studies have shown that excessive use of digital devices can cause developmental problems. Children who frequently use smartphones tend to have lower social skills (Park & Park, 2021; Przepiorka et al., 2021; Zayia et al., 2021). Excessive screen

exposure affects impulsive behaviour and children's attention span (Namazi & Sadeghi, 2024; Wu et al., 2022). However, these studies generally focus on school-age children rather than on early childhood, when children are still in the early stages of development. Focusing on early childhood is important because this phase is the foundation for children's cognitive, emotional, and social development. By understanding the impact of smartphones at an early age, more effective prevention strategies can be formulated to reduce the risk of suboptimal development.

Unlike previous studies that only highlighted the duration of smartphone use, the novelty of this study lies in an in-depth analysis of the influence of Smartphones on the development of early childhood behaviour and emotions. This study also considers the quality of children's interactions with smartphones (Konrad et al., 2021; Lederer et al., 2022; Matthes et al., 2021). In addition, this study highlights parents' roles in regulating technology use at home (Coyne et al., 2021; Misirli & Ergulec, 2021; Steinfeld, 2021). By combining behavioural, emotional, and parenting aspects, this study offers a more comprehensive perspective. By understanding these dynamics, this study is expected to serve as a reference for parents, educators, and policymakers in developing guidelines for the appropriate use of technology in early childhood.

The results provide evidence that excessive or uncontrolled smartphone use can inhibit the development of behaviour and emotions in early childhood. Children who frequently use smartphones tend to show decreased social interaction and emotional management skills (Abdulla et al., 2023; Mallawaarachchi et al., 2022). In addition, dependence on smartphones can inhibit children's ability to deal with frustration and develop independence (Rodríguez-Torrice et al., 2023). Therefore, parental supervision and strategies to limit smartphone use are essential to ensure healthy development. By understanding these impacts, it is hoped that solutions can be found to maintain a balance between technology and children's developmental needs.

The development of technology, including smartphones, is believed to support children's development through the educational content and interactive entertainment it offers. The theory of child development, as put forward by Piaget, emphasises the importance of direct interaction with the environment for optimal learning (Pesch et al., 2024; Rochat, 2024; Saracho, 2023). Several studies have previously examined the impact of smartphone use on children. For example, studies by Chang et al. (2022) and Fang et al. (2021) found that excessive smartphone use can reduce children's ability to focus and cause behavioural disorders. Other studies have shown a relationship between the use of digital devices and delays in social-emotional development (Gou & Perceval, 2023; Radesky et al., 2023). However, most of these studies focus on school-age children rather than on young children in a critical developmental phase. The position of this study is to fill this gap by studying how smartphones affect early childhood, especially in terms of behaviour and emotions. In addition, this study is important to provide a more specific picture of the risks that emerge early and their impact on the long-term development of early childhood.

The purpose of this study is to answer important questions related to smartphone use: How does smartphone use affect the social behaviour of early childhood? By answering this question, the study aims to identify problems arising from smartphone use at an early age. The results of this study are expected to provide practical guidance to minimise negative impacts and maximise the benefits of digital technology in supporting early childhood development. The focus of this research is the novelty of smartphone use's influence on the behaviour and emotions of early childhood in the current digital era. This study not only examines usage time but also examines how the

quality of children’s smartphone interactions affects their ability to manage emotions and interact socially. In addition, this study considers the role of parents in technology use, providing comprehensive insight into family dynamics in the digital era. Thus, this study offers a more in-depth perspective compared to previous studies that are more general or focus on older children. This approach allows for a new understanding of the risks and opportunities of digital technology use in early childhood.

This study argues that although smartphones have educational potential, their uncontrolled use can negatively affect the development of behaviour and emotions in early childhood. Children who are frequently exposed to smartphones tend to experience delays in social skills and emotional management due to reduced direct interaction with the environment. In addition, smartphone use as a distraction can hinder children’s ability to cope with frustration independently. Based on this argument, this study will examine the extent to which the intensity and pattern of smartphone use affect the development of early childhood. The expected results are empirical evidence that supports the importance of regulating smartphone use to ensure that early childhood can develop optimally emotionally and socially.

RESEARCH METHODS

This study employed a qualitative case-study design to explore the influence of smartphone use on the behaviour and emotions of young children. The case study design was chosen because it allows researchers to examine social and behavioural phenomena in depth within a specific real-life context (Kekeya, 2023). Through this approach, the research focuses on understanding how smartphone exposure affects children’s social interaction, emotional regulation, and attention patterns in their natural learning environment. A qualitative case study also enables the researcher to obtain rich, contextual data from various perspectives, particularly from educators and parents who directly observe children’s daily behaviour.

The research was conducted at PAUD Siratul Islam Sumenep, an early childhood education institution where children aged 3–6 years participate in structured learning and play activities. This location was selected because the institution represents a learning environment in which children are increasingly exposed to digital devices, including smartphones, both at home and in educational contexts. In addition, the school provides an appropriate setting to observe children’s social interactions, emotional responses, and behavioural patterns during learning and play. The presence of teachers and parents who actively monitor children’s development also enables the researcher to obtain comprehensive information on the impact of smartphone use on early childhood behaviour and emotions.

The research involved several informants, consisting of educators and parents who were directly involved in children’s learning processes and daily supervision. Informants were selected using purposive sampling, in which participants were chosen for their relevance and experience related to the research topic. Educators were selected because they observe children’s behaviour during learning activities, while parents were chosen because they understand children’s smartphone usage patterns at home.

Table 1. Informants Data

Informant Category	Number	Educational Background	Reason for Selection
PAUD Teachers	3	Bachelor’s in Early Childhood Education / Education	Teachers directly observe children’s behaviour, emotional responses, and social interactions during learning activities.

Parents of Students	3	Senior High School – Bachelor’s Degree	Parents understand children’s smartphone usage patterns and behavioural changes at home.
Children (observational subjects)	10	Early childhood students (3–6 years)	Children are the main subjects observed to identify behavioural and emotional changes related to smartphone exposure.

Data collection in this study was carried out using several techniques to obtain comprehensive information (Sarfo et al., 2021). First, direct observation was conducted to examine children’s behaviour during learning activities, play sessions, and peer interactions. The observations were conducted over three months to identify behavioural patterns, including social interaction, emotional responses, and attention levels. Second, in-depth interviews were conducted with teachers and parents to understand their perspectives regarding children’s smartphone use and its potential impact on behavioural and emotional development. Third, questionnaires were distributed to parents and educators to collect additional data on children’s smartphone usage habits, duration of use, and observed behavioural changes. In addition, the study employed a desk review of relevant literature to support the theoretical framework and contextualise the findings on digital technology use in early childhood.

The data analysis process followed several stages, including data condensation, data display, and data verification, adapted from qualitative data analysis procedures (Sarfo et al., 2021). Data condensation involved selecting, simplifying, and organising the information obtained from observations, interviews, and questionnaires to focus on key themes related to behavioural and emotional changes. Next, the data were presented through displays, including narrative descriptions and categorised findings that illustrate patterns in children’s social behaviour, emotional regulation, and attention levels. Finally, data verification and conclusion drawing were conducted to interpret the patterns that emerged from the data and to ensure the validity of the findings. To enhance the research’s trustworthiness, data triangulation was used by comparing information from different sources, including teachers, parents, and direct observations of children. This process ensured that the conclusions accurately reflected the actual conditions surrounding smartphone use and its influence on early childhood behaviour and emotions.

RESULTS AND DISCUSSION

Results

The findings of this study provide an overview of how smartphone exposure relates to behavioural and emotional dynamics among young children in the learning environment. The results highlight three main aspects: changes in children’s social behaviour, emotional responses during learning activities, and recommendations for wise smartphone use supported by alternative interactive activities. These findings provide insights into children’s developmental experiences within structured educational settings.

Social Behaviour Changes in Toddlers

Changes in social behaviour in toddlers at PAUD Siratul Islam are operationally defined as observable transformations in children’s attitudes, interactions, and social skills during learning and play activities. These changes include the ability to share toys, cooperate with peers, follow classroom rules, and express emotions appropriately in

social situations. In the field, this sub-finding refers to behavioural shifts among children aged 3–6 years who initially showed limited interaction or preferred solitary play but gradually demonstrated greater participation in collaborative activities. Social behaviour changes are identified through children’s daily interactions with classmates, responses during group learning, and their willingness to participate in cooperative games organised by teachers. These indicators provide practical evidence that children’s social competencies can develop through structured learning environments that emphasise communication, cooperation, and positive interactions in early childhood education settings.

The first interview with Anisah, a teacher at PAUD Siratul Islam, revealed that some children initially experienced difficulty interacting with peers and tended to isolate themselves during playtime. She explained, “At the beginning, several children preferred to play alone and rarely joined group activities. They often kept their toys to themselves and did not respond when other children invited them to play together.” According to the teacher, gradual behavioural changes began to appear after children regularly participated in structured group activities such as role-playing sessions and collaborative games. These activities encouraged children to communicate and interact with one another. Based on the researcher’s interpretation, the teacher’s statement indicates that consistent social stimulation through classroom activities can gradually encourage children to move from individualistic play patterns toward cooperative interaction, thereby strengthening their basic social competencies during early childhood development.

The second interview was conducted with Fitriana, the parent of one of the students. She described the behavioural change she observed in her child at home after participating in school activities. She stated, “Before attending school, my child was very shy and rarely greeted friends. He preferred to stay close to family members and avoided interacting with other children.” She further explained, “After joining storytelling sessions and group games at school, my child began to talk more about his friends and even invited them to play together.” Based on the researcher’s interpretation, this statement suggests that structured social learning experiences at school not only influence children’s behaviour within the classroom but also extend to their interactions at home. Exposure to cooperative activities appears to increase children’s confidence and willingness to communicate, suggesting that early childhood educational environments can play a significant role in strengthening children’s social adaptability.

Observations conducted over three months at PAUD Siratul Islam showed noticeable improvements in children’s social behaviour during daily learning activities. At the beginning of the observation period, approximately 60% of children appeared reluctant to share toys or participate in group play. Many children preferred solitary activities and showed hesitation when invited to collaborate with peers. However, after teachers consistently introduced collaborative learning activities, such as traditional running games and small-group discussions, the number of children exhibiting reluctant behaviour decreased to around 20%. During subsequent observations, children were more willing to share learning materials, help classmates with tasks, and show empathy when peers encountered difficulties. Restating these findings, the data indicate that repeated exposure to cooperative learning activities created opportunities for children to practice social interaction, leading to observable improvements in sharing behaviour, teamwork, and emotional responsiveness.

The data above show a clear pattern indicating that social interaction in early childhood can develop significantly when learning activities emphasise cooperation and shared participation. Children who were initially hesitant to interact gradually became more comfortable communicating and playing with their peers after being involved in structured group activities. The learning environment played an important role in shaping these behavioural changes by providing opportunities for children to practice social skills in a supportive setting. Activities involving collaborative play allowed children to experience situations where sharing, helping others, and following rules were necessary to complete tasks successfully. Over time, repeated engagement in these interactions encouraged children to develop a stronger sense of empathy and collective responsibility within the classroom environment. This pattern suggests that consistent social learning experiences can contribute to the development of positive social behaviour among young children.

Children’s Emotional Responses in Learning Activities

Children’s emotional responses in learning activities at PAUD Siratul Islam are operationally defined as observable reactions shown by children aged 3–6 years when they participate in classroom activities, including play, storytelling sessions, group discussions, and interactive games. These responses include expressions of happiness, frustration, excitement, anger, or calmness that appear during the learning process. In the field, emotional responses are identified through children’s verbal expressions, body language, and behavioural reactions when facing challenges, interacting with peers, or receiving instructions from teachers. Indicators such as the ability to calm themselves, express feelings verbally, respond appropriately to peer interactions, and show empathy toward others are used to understand children’s emotional responses. These observable behaviours provide practical evidence regarding how children manage their emotions within a structured early childhood learning environment.

Table 2. Observation of Children’s Emotional Responses in Learning Activities

Observation	Indicator
Several children initially cried loudly when peers took their toys during playtime activities.	Difficulty controlling emotional reactions in social situations.
Some children showed frustration and threw toys when they were unable to complete classroom tasks.	Impulsive emotional expression when facing challenges.
During storytelling activities, several children began to express their feelings by explaining why a character in the story felt sad or happy.	Ability to recognise and verbalise emotions.
In group play sessions, children who previously reacted with anger began asking teachers for help when conflicts occurred.	Development of emotional regulation and problem-solving behaviour.
During reflective play sessions, several children were able to calm themselves after experiencing disappointment in games.	Improvement in self-regulation and emotional awareness.

Table 2 indicates that children’s emotional responses gradually changed during classroom activities. At the beginning of the observation period, several children tended to react impulsively to challenges, such as crying loudly, throwing objects, or becoming frustrated when they could not complete a task. However, as learning activities continued, children began to demonstrate more controlled emotional expressions. Many children began to verbalise their feelings, seek assistance from teachers when experiencing conflict, and show greater awareness of their peers’ emotional states.

Restating the findings, the data suggest that children who previously expressed emotions through impulsive behaviour gradually developed the ability to communicate their feelings more constructively during classroom interactions. Observations also showed that structured learning activities, particularly storytelling and reflective play, provided opportunities for children to practice recognising and managing their emotions within social learning situations.

The pattern emerging from these findings suggests that children's emotional responses develop through repeated engagement in interactive learning environments. When children are exposed to activities that encourage communication and reflection, they gradually become more capable of recognising their emotional states and responding appropriately to different situations. Learning activities that involve storytelling, cooperative play, and guided reflection appear to foster conditions in which children can observe emotional expressions, practice empathy, and regulate their reactions. Over time, these experiences contribute to a shift from impulsive emotional reactions toward more controlled and socially appropriate responses. The data indicate that consistent exposure to supportive classroom interactions allows children to develop greater emotional awareness and self-regulation, which are essential components of early social-emotional development in educational settings.

Recommendations for Wise Smartphone Use

Recommendations for wise smartphone use at PAUD Siratul Islam are operationally defined as practical guidelines implemented by teachers and parents to ensure that children aged 3–6 years use smartphones in a balanced and developmentally appropriate manner. In the field context, wise smartphone use refers to limiting the duration of smartphone exposure, selecting educational or age-appropriate content, ensuring adult supervision, and balancing digital activities with physical play and social interaction. These recommendations are not only communicated verbally by teachers to parents but are also reinforced through classroom activities that encourage children to participate in interactive learning and outdoor play. The operational indicators of wise smartphone use include reduced dependency on smartphones during learning, increased participation in physical and social activities, and the development of healthier daily routines that prioritise active engagement with peers and the surrounding environment.

The findings in the field show a practical flow of actions taken by teachers and parents to encourage children to use smartphones wisely. These findings can be illustrated through several interconnected steps that reflect the process of guiding children toward healthier digital habits. First, teachers identify children who tend to show decreased concentration or reduced participation in class activities due to frequent smartphone use at home. Second, teachers communicate recommendations to parents regarding limiting the duration of smartphone use and selecting appropriate digital content. Third, teachers introduce alternative activities that stimulate social interaction and physical movement, such as traditional games and outdoor play. Fourth, children gradually become more engaged in peer collaboration, reducing their reliance on smartphones during leisure time. Fifth, parents begin to apply simple rules at home, such as device-free time or allowing smartphone use only after completing daily routines. As supporting documentation, photographs showing children playing traditional outdoor games together can illustrate how children engage in physical activities and social interaction as alternatives to excessive smartphone use.



Figure 1. Photo of Children Playing Traditional / Outdoor Games

Observations on Figure 1 conducted during learning and play activities showed that children who previously appeared less active in classroom participation gradually became more engaged when teachers emphasised outdoor activities and collaborative play. Several children who were previously distracted during indoor learning activities showed greater enthusiasm when participating in traditional outdoor games with their peers. During these activities, children were observed running, cooperating in team play, and communicating more actively with friends. These situations created opportunities for children to interact socially and express their emotions more freely compared to when they were engaged with digital devices. The researcher interprets the presence of attractive alternative activities as reducing children’s dependence on smartphones by redirecting their attention toward more stimulating and developmentally beneficial social and physical experiences.

Restating the findings, the data indicate that implementing wise smartphone-use recommendations involves collaboration between teachers and parents to foster a balanced environment for children’s development. When smartphone usage is limited and accompanied by engaging learning activities, children appear more focused and involved in classroom interactions. Outdoor play and traditional games provide children with opportunities to develop social skills, emotional expression, and physical coordination. These activities also encourage children to build friendships and communicate more frequently with peers. The findings suggest that reducing excessive smartphone use is not achieved merely by restricting device use, but also by providing meaningful alternative activities that engage children’s interest and encourage active participation.

The overall pattern emerging from the data suggests that wise smartphone use in early childhood requires a balanced approach that integrates digital regulation with stimulating real-world experiences. When children are provided with opportunities to engage in outdoor play, collaborative games, and interactive learning activities, their interest naturally shifts toward social and physical engagement. This shift reduces their dependence on digital devices and encourages healthier behavioural patterns. The learning environment plays an important role in facilitating this transition by creating

conditions where children feel motivated to interact with peers and participate in group activities. The pattern observed indicates that consistent guidance from teachers and parents, combined with engaging alternatives such as traditional outdoor games, contributes to the development of healthier digital habits and supports children's overall social, emotional, and behavioural development.

Discussion

The findings of this study indicate that social behaviour among early childhood children develops through repeated participation in cooperative learning activities. The results showed that children who initially preferred solitary play gradually became more willing to interact, share toys, and collaborate with peers after engaging in group-based activities such as storytelling, role-playing, and traditional games. These findings align with previous studies on early childhood social development, which suggest that structured social interaction within learning environments can significantly strengthen children's communication skills and cooperative behaviour (Sperati et al., 2024; Winter et al., 2022). Early childhood education environments that emphasise interaction and collaboration are known to provide opportunities for children to practice empathy, negotiation, and mutual assistance in daily activities (Arnold et al., 2021; Cunha et al., 2021; Liu et al., 2021). However, the present study highlights a contextual dimension that is not always emphasised in previous literature, namely, the integration of local cultural activities such as traditional games as a medium for fostering social interaction.

The study also found that children's emotional responses during learning activities developed gradually as they participated in structured, reflective classroom experiences. Initially, many children expressed their emotions impulsively, crying, becoming frustrated, or throwing objects when facing challenges. Over time, however, children began to demonstrate more controlled emotional reactions, including expressing feelings verbally and seeking assistance from teachers during conflicts (Featherston et al., 2024; Lee et al., 2023). This pattern is consistent with existing literature on emotional regulation in early childhood, which explains that children develop emotional awareness and self-regulation through guided social interactions and reflective learning experiences (Albin-Clark et al., 2023; Dennis, 2021; Siraj et al., 2023). Learning activities such as storytelling and guided play have been widely recognised as effective tools for helping children recognise and articulate emotions. The findings of this study reinforce these theoretical perspectives by showing that repeated exposure to such activities improves emotional regulation among young learners.

Another important finding concerns the role of learning environments in shaping children's responses to challenges and interpersonal interactions. Observations revealed that when children were given opportunities to participate in cooperative learning activities and group discussions, they gradually developed stronger emotional awareness and empathy toward their peers. This finding is consistent with social learning theories that emphasise the importance of interaction and modelling in the development of socio-emotional competencies (Chia et al., 2022; Pontin et al., 2021). Through observation and participation in shared activities, children learn how to interpret emotional cues, regulate their reactions, and respond appropriately to others. Compared with previous studies that often focus on individual emotional development, the results of this research highlight the significance of collective learning experiences in shaping emotional behaviour (Al-Azri et al., 2020; Podolski et al., 2023).

The findings on smartphone use also provide important insights into the relationship between digital exposure and children's behavioural engagement in learning activities. The study found that children who frequently used smartphones without supervision tended to show lower concentration and reduced participation in classroom interactions. These results are consistent with several studies in digital childhood research that highlight the potential negative effects of excessive screen exposure on attention span and social engagement in young children. However, this study extends the existing literature by emphasising that the solution is not merely restricting smartphone use but also providing meaningful alternative activities that stimulate physical movement and social interaction. When teachers introduced traditional outdoor games and collaborative play, children showed increased enthusiasm, communication, and engagement with peers.

Finally, the study demonstrates that wise smartphone use requires collaboration between teachers and parents to foster a supportive environment for children's development. The findings show that when parents implement simple rules such as limiting screen time and encouraging outdoor play, children gradually become more engaged in social activities and learning interactions. This result aligns with existing literature emphasising the importance of parental mediation and adult supervision in children's use of digital media. However, the present research highlights that such guidance is more effective when integrated with school-based learning strategies that offer engaging alternatives to digital entertainment. From a theoretical standpoint, this supports the ecological perspective on child development, which emphasises that interactions among family, school, and social environments shape children's behaviour. Practically, the findings imply that policies related to children's digital media use should involve both educators and parents in establishing consistent routines that balance technology with physical, social, and emotional learning experiences.

CONCLUSION

This study demonstrates that smartphone exposure significantly influences early childhood social behaviour and emotional development within learning environments. Children who frequently use smartphones without adequate supervision tend to show reduced social interaction, lower concentration, and more impulsive emotional responses. Nevertheless, these effects can be minimized through structured educational activities such as cooperative learning, storytelling, reflective play, and traditional outdoor games that encourage direct social engagement. The findings highlight the importance of maintaining a balance between digital exposure and real-world social experiences to support healthy child development. By combining observations, interviews, and contextual learning activities, this research provides valuable insights into the relationship between digital technology and early childhood education. However, the study was limited to a single institution and a relatively small participant group. Future studies should involve broader educational settings, larger samples, diverse socio-cultural contexts, and longitudinal approaches to better understand the long-term impact of smartphone use on children's socio-emotional, cognitive, and learning development.

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